Three New Species of *Cordia* (Boraginaceae) from the Guianas

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ABSTRACT. Three new species of *Cordia* (Boraginaceae) are described from the Guianas. *Cordia cremersii* and *C. marioniae* belong in section *Varronia*, and *C. fanchoniae* in section *Myxa*. *Cordia marioniae* is known from the Rupununi savanna in the south of Guyana; the two other species have been collected in French Guiana.

Key words: Boraginaceae, *Cordia*, French Guiana, Guyana, sect. *Myxa*, sect. *Varronia*.

Only a few species of Boraginaceae have been added to those known from the flora of the Guianas since the last treatments by Johnston (1932, 1935), and addition by Uittien (1937). In contrast, recent treatments from neighboring countries (Estrada S., 1995; Gaviria, 1987; Taroda & Gibbs, 1986) described many new taxa, but none of those have been documented to extend into the Guianas. During the preparation of the treatment of the Boraginaceae for *Flora of the Guianas*, some of the collections studied proved to be new species. *Cordia wurdackiana* was published recently (Feuillet, 1997) and three new species of *Cordia* L. are described here, namely *C. cremersii* and *C. fanchoniae*, both from French Guiana, and *C. marioniae* from Guyana. *Cordia* is a large pantropical genus with an estimated 350 species (Miller, 2001); it is the largest genus in the Boraginaceae and mostly Neotropical in distribution. *Cordia* has not been treated as a whole since de Candolle (1845), the many modern studies have mostly been of limited geographic scope, and the genus is badly in need of monographic study.

CORDIA SECT. *MYXA* (ENDLICHER) DC.

Cordia sect. *Myxa* (Endlicher) DC. is by far the largest section of *Cordia*, and the only one of the six currently recognized sections to be well represented in all tropical regions. It is a group of ca. 200 species (Miller, 2001) that are mostly trees with small white flowers in loose panicles and calyces that are explanate under the fruits. It includes all but two of the Old World species and the majority of the New World rain forest species. Seventeen of the 29 species of *Cordia* in the Guianas belong in section *Myxa*.

Cordia fanchoniae Feuillet, sp. nov. TYPE: French Guiana. Piste de Saint-Élie, 20 km from RN 1, 5°20′N, 53°00′W, 8 Nov. 1995 (fl & fr), *M.-F. Prévost & A. Cortès 3188* (holotype, US; isotypes, CAY(2), NY, P). Figure 1A–C.

Species ad *Cordiam* sectionem *Myxam* pertinens; brevibus ramosisque cymosis inflorescentiis, supra glabris et infra minuti-pilosis foliis, rubris, atromaculatis, obliquis fructibus notabilis.

Woody monocaulous plant 0.5–1.5 m tall, blooming as small as 0.50 m tall. Internodes 3–20 mm long. Stems densely short strigose. Leaves: petiole canaliculate, short, up to 1.5 cm long, densely short pubescent; blades narrowly oblong to elliptic or oblanceolate, 14–32 × 4–8 cm, acute and slightly decurrent at base, acuminate at apex, margin entire and recurved, with 8 to 12 main lateral veins on a side, the adaxial face drying brown, glabrous to glabrescent, veins concolorous, main lateral veins impressed, smaller veins raised, sometimes somewhat white, the abaxial face drying tan to olive-green, seeming glabrescent except on the veins, but actually with some obscure pubescent, main lateral veins raised, brown, tertiary veins yellowish, somewhat obscure. Inflorescence axillary, condensed, cymose, branched, branches scorpioid, to 2 cm long, blooming acropetally, densely 15- to 20-flowered; calyx barrel-shaped at anthesis, 4–5 mm long, 5-lobed, with a dense indumentum of thick straight hairs outside, short appressed pubescent inside, lobes triangular, up to 1.5 mm long, later torn into a 5- to 8-toothed, nearly flat plate under the fruit, whitish, glossy and glabrous inside; corolla white, tube 5 mm long, lobes oblong, rounded at apex, 1.5–2 × 1.5 mm, reflexed against the calyx, glabrous; in male flowers: stamens inserted on the corolla tube below middle, exserted, nearly 2 mm out of the corolla tube, filaments 3.0–3.5 mm long, long hirsute at base, glabrous above, anthers sagittate or V-shaped; ovary lacking, replaced by a tuft of long hairs; in female flowers: no stamen observed, ovary

Figure 1. A–C. *Cordia fanchoniae* Feuillet. —A. Leafy stem with inflorescences, the apical leaf showing venation pattern. —B. Open corolla and stamens. —C. Gynoecium. D–F. *Cordia cremersii* Feuillet. —D. Leafy stem with inflorescence, the apical leaf showing venation pattern. —E. Open corolla and stamens. —F. Gynoecium. G–I. *Cordia marioniae* Feuillet. —G. Leafy stem with inflorescences, the apical leaf of the lateral branch showing venation pattern. —H. Open corolla and stamens. —I. Gynoecium. (A–C based on the US holotype, *Prévost & Cortès 3188*; D–F based on the US holotype, *Cremers & de Granville 13934*, and a photograph of a live plant by J.-J. de Granville; G–I based on the US holotype, *Jansen-Jacobs et al. 3931*.)

glabrous, broadly conical, 0.5–0.8 mm, 5-lobed at base, style hirsute below 1st branching, glabrous above, branched 1.0–1.2 and 1.5–1.7 mm above the base, 4 terminal segments 1.2–1.5 mm long, swollen and somewhat 2-lobed at apex. Fruit a drupe, oblique in the calyx, 10 × 6 mm, base asymmetric, round, tapering to the slightly acute (when fresh) apex, mucronate, glabrous, abscission of the style when fruit becomes bright red, black around insect exit hole; stone not seen (all fruits emptied by insect larvae).

Cordia fanchoniae is known only from the basin of the lower Sinnamary River in the center of northern French Guiana. The type was collected on an abandoned timber unloading track. Flowering in June–July and November; fruiting in June and November.

This new species most closely resembles *Cordia nervosa* Lamarck of *C.* sect. *Myxa*, also from the Guianas. *Cordia fanchoniae* differs from *C. nervosa* in having longer and narrower leaf blades that are acute and slightly decurrent at the base, in its calyx densely hairy outside and clearly 5-lobed, and glabrous fruits. It differs from all other species of *Cordia* sect. *Myxa* of the Guianas in its axillary inflorescences. All collections, *Prévost & Cortès 3188* and *Loubry 1194* (0.5 m tall), and *Molino et al. 1854* (1.5 m), have a monocaulous habit and axillary inflorescences. Whether or not the stem later branches and has terminal inflorescences, this monocaulous growth may be viewed as a sign of neoteny equivalent to the sterile first growth unit typical of *Cordia* sect. *Myxa*.

The architectural model corresponding to the growth pattern of *Cordia fanchoniae* is Corner's model as defined by Hallé and Oldeman (1970) and Hallé et al. (1978). As shown in *Prévost & Cortès 3188* (CAY, sheet 2), after a traumatic reiteration as defined by Oldeman (1974), the new shoot is monopodial, unbranched, and the inflorescences are axillary. Previously known architectural models in *Cordia* are Prévost's (sect. *Myxa*: spp.), Fagerlind's (sect. *Gerascanthus* (Browne) G. Don: *C. alliodora* (Ruiz & Pavón) Oken), and Champagnat's (sect. *Varronia*: spp.).

Cordia fanchoniae is named to honor my friend and collector of the type, Marie-Françoise "Fanchon" Prévost, who has a keen eye for unusual species and plant architecture.

Paratypes. FRENCH GUIANA. Near the lake of Petit Saut dam (Sinnamary River), 5°03′N, 52°54′W, 3 July 1997 (fl), *J.-F. Molino, D. Sabatier & D. Paget 1854* (CAY, US); Piste de Saint-Élie, 22 km from RN 1, 5°20′N, 53°00′W, 18 June 1991 (fl & fr), *D. Loubry 1194* (CAY).

Cordia sect. *Varronia* (Browne) G. Don

Cordia sect. *Varronia* (Browne) G. Don is well represented in open vegetation in Neotropical regions. It is a group of ca. 100 American species (Miller, 2001) with a shrubby habit and inflorescences condensed in a spike or a head and calyces cupular or campanulate, partially or totally enclosing the fruits. In the Guianas, 8 of the 29 species of *Cordia* belong in section *Varronia*.

Cordia cremersii Feuillet, sp. nov. TYPE: French Guiana. Bassin de l'Oyapock, Roche Touatou, 150 m, 2°57′N, 52°32′W, 16 May 1995 (fl), *G. Cremers & J.-J. de Granville 13934* (holotype, US; isotypes, CAY, NY, P, U). Figure 1D–F.

Species ad *Cordiam* sectionem *Varroniam* pertinens; 1.2 × 1 cm globosis capitibus inflorescentiarum, 0.7–1.0 cm longis pedunculis sub anthesi, 1.5–2 cm longis post anthesin, pubescentibus foliis notabilis.

Shrub 1.5–2 m tall. Twigs with internodes 6–9 mm long, pubescent near the apex. Leaves: petioles to 5 mm long, densely hairy; blades ovate or less often elliptic, 3–8 × 1.2–3 cm, cuneate at base, acute at apex, margin serrulate to doubly serrate, upper surface drying dark brown, densely pubescent becoming glabrescent, veins impressed except a narrow and raised midrib, lower surface with a white and dense pubescence, venation brown showing through, veins raised including a wide midrib, 5 to 7 main veins on a side. Inflorescence terminal and axillary, condensed heads 1.2 × 1 cm, on a short peduncle 0.7–1.0 cm long at anthesis, becoming 1.5–2 cm long when fruiting, 15- to 25-flowered; calyx funnel-shaped, 4 mm long, including five 0.5–1.5 mm long teeth, yellow-green at anthesis, with scattered white trichomes outside, slightly denser toward the apex, much denser in bud; corolla tube 4–5 mm long, 5 lobes broadly elliptic, rounded at apex, reflexed, 7–10 × 5 mm, white, pubescent to glabrescent; stamens inserted on the corolla tube at or slightly below middle, barely exserted, filaments 1.5–2 mm long, with a tuft of hair at base, anthers subglobose, ca. 0.5 mm long; ovary conical, obtuse at apex, 0.5–0.6 mm long, glabrous, style glabrous, branched 0.7–0.8 mm and 1.1–1.3 mm from base, the 4 terminal segments ca. 0.7 mm long, not swollen at apex. Fruit not seen.

Cordia cremersii is known only from southeast French Guiana from the type collection discovered on the southern slope of Roche Touatou at about 150 m elevation. The population was growing at the limit of the brush-islands on the "savane roche." Flowering in May.

This new species most closely resembles *Cordia harleyi* Taroda of *C.* sect. *Varronia*, known only from the state of Bahia (Brazil). *Cordia cremersii* differs from *C. harleyi* in its shorter petioles, longer and narrower leaf blades that are cuneate (vs. truncate at base) and acute to long acute at apex (vs. obtuse or rounded), its denser and longer pubescence on the adaxial surface of the leaves, and its shorter inflorescence peduncle and somewhat smaller corolla.

Cordia cremersii is named to honor Georges Cremers, a discoverer of this new species, as well as a tireless field botanist with whom I have collected plants many times in French Guiana.

Cordia marioniae Feuillet, sp. nov. TYPE: Guyana. Rupununi District: Dadanawa, 120 m elev., 2°49′N, 59°31′W, 6 June 1995 (fl & fr), *M. J. Jansen-Jacobs, B. J. H. ter Welle, C. Gustafsson & V. James 3931* (holotype, US; isotypes, BRG, GB, MO, U). Figure 1G–I.

Species ad *Cordiam* subg. *Varroniam* pertinens; spicatis inflorescentiis, 3–5 cm longis pedunculis, obovatis foliis, supra scabridis, infra pubescentibus, late rotundato apice notabilis.

Shrub. Twigs with long internodes 1–2 cm long. Leaves: petioles 5–8 mm long, with very short pubescence; blades obovate, 3.5–8 × 2–4.5 cm, attenuate at base, broadly rounded at apex, margin obscurely and loosely serrate above middle, trichomes appressed, short, stiff, white above, longer, soft, dense, erect, curved beneath, midrib and secondary veins visible above, beneath tertiary venation netting visible, drying chocolate brown above, paler with dark veins beneath, 4 to 6 main veins on a side. Inflorescence spikes blooming basipetally, terminal and in a few apical axils, peduncle not adnate to petiole, 3–5 cm long, fertile part 3–6 cm long, densely 15- to 40-flowered; calyx pale green, cup-shaped, about 2 mm long, including 5 triangular lobes, 0.5 mm long, with a white, appressed indumentum outside; corolla white, tube 5 mm long, salveriform, 5 lobes reflexed, round, emarginate at apex, ca. 0.5–0.6 × 0.7–0.8 mm, glabrous; stamen inserted on the corolla tube ¼ of the length from the base, barely exserted, filaments 2 mm long, with a tuft of hair on the proximal ⅓, anthers broadly elliptic; ovary broadly conical, ca. 0.7 mm long, glabrous, style glabrous, divided twice in 2 branches (nearly at the same point) ca. 1.8 mm from base, 4 terminal segments ca. 1.7 mm long, narrowly swollen in the apical half. Young fruit spherical.

Cordia marioniae is known from two collections discovered 150 years apart in the Rupununi District, near Dadanawa close to the southwest corner of the Kanuku Mountains. The type collection is from a shrub growing in a small, rather dry bush-island in the savanna. The older paratype, *Schomburgk 1304*, from the bank of the Rupununi does not have any flower or fruit left on the peduncles, but shows the typical leaf shape of the species. Dadanawa is close to the Rupununi River where the plant probably grew in the clear, narrow gallery forest. Flowering and fruiting in May–June.

Cordia marioniae is easily set apart from all other species of section *Varronia* by the obovate shape of the leaf blades. It is also characterized by the straight, thin inflorescence peduncle.

Cordia marioniae is named after Marion Jansen-Jacobs, collector of the type, colleague, and long-time student of the flora of the Guianas with whom I had the privilege to collect plants both in Guyana and French Guiana.

Paratype. GUYANA. "Ufer des Flüsses Rüpününi in Brit. Güiana," May 1843, *Rich. Schomburgk 1304* (B).

KEY FOR *CORDIA* SECT. *VARRONIA* IN THE GUIANAS

1a. Inflorescences capitate.
  2a. Inflorescences branched; flower heads < 5 mm diam . . . . . *C. polycephala* (Lamarck) I. M. Johnston
  2b. Inflorescences unbranched; flower heads > 5 mm diam.
    3a. Peduncles > 5 cm long; corollas > 3 cm long *C. grandiflora* (Desvaux) Kunth
    3b. Peduncles < 3 cm long; corollas < 2 cm long . . . . . *C. cremersii* Feuillet
1b. Inflorescences spicate.
  4a. Inflorescence peduncles adnate to the petiole base.
    5a. Leaf blades adaxially dull; inflorescences densely flowered (calyces touching each other and without gaps in the fertile part on the inflorescences); calyx lobes acuminate, acumen free in closed buds . . . . . *C. tomentosa* (Lamarck) Roemer & Schultes
    5b. Leaf blades adaxially shiny; inflorescences loosely flowered (with gaps in the fertile part on the inflorescences between flowers or groups of flowers); calyx lobes not acuminate . . . . . *C. schomburgkii* DC.
  4b. Inflorescence peduncles not adnate to the petiole base.
    6a. Leaf blades adaxially glabrous; inflorescences only terminal . . . . . *C. curassavica* (Jacquin) Roemer & Schultes
    6b. Leaf blades adaxially hairy; inflorescences terminal and axillary.
      7a. Leaf blades obovate, widely rounded at apex . . . . *C. marioniae* Feuillet

7b. Leaf blades ovate, acute at apex
. . . . *C. stenostachya* Killip ex Gaviria

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